"Thin slices of coconut husk, with its rather spongy texture, are laid between the planks of a canoe before they are gummed and lashed together. They expand when wet, and keep the seams tight.

Charcoal from burnt coconut husks is mixed with coral lime to make the putty or mortar used to seal the holes in a canoe hull where the lashing runs through."

1: Burrows--32 (1947-48) Woleaians
342, 396 Ifalik

"Sennit cordage has an indefinite variety of uses. One of the most important is that of fastening together the timbers of canoes and houses, where it replaces the nails of our culture."

1: Burrows--36 (1947-48) Woleaians
116, 322, 396, 245 Ifalik

"The yellow wood of the breadfruit is light, soft, and easily worked, yet does not split easily and is said to be very durable. It constitutes the underbody of nearly all canoe hulls (I saw one small underbody of the tougher ragues (Calophyllum inophyllum), a favorite in high islands.) Breadfruit wood is also used for all canoe planks and outrigger floats. Only smaller parts subject to special strain, like end posts, outrigger booms, and the sticks and braces of the outrigger attachments, are made of harder and heavier wood."

1::Burrows--41 (1947-48) Woleaians
116, 285, 396 Ifalik

"Leaves of the variety of pandanus called far en Nuta, cured but not bleached, are used for sails. Matting for sails is plaited in strips about a foot wide. These are sewed together with sinnet cord, using stitches several inches long. Seams are run both vertically and horizontally. The advantage of making the sail in strips is that it usually limits tearing to one strip. Thus a torn place can be repaired by replacing a single strip of matting."

1: Burrows--52 (1947-48) Woleaians
116, 396, 554 Ifalik

"A canoe, of all material possessions, brings most glory to its owner. And the building of canoes is beyond comparison the most highly developed craft in Ifalik. Anyone can build a little one; but the construction of that master-piece of Micronesian workmanship, a sea-going sailing canoe, requires the permission of the chiefs, and is entrusted only to recognized experts (sennap), who have learned their art by something like apprenticeship from another expert. During our stay, seven men were recognized as master-shipwrights. The honor accorded this title is exceeded by only two others: that of hereditary chief, and that of navigator (palū), who can pilot one of these canoes to other islands."

1: Burrows--44-45 (1947-48) Woleaians
396 Ifalik

"The aerial roots of the giliao, a banyan, are sometimes used for preliminary lashing on a canoe, before the permanent lashing of sennit cord is put on.

A dried moss is sometimes laid between the planks of a canoe. It is said to [45] decrease leaking. This was not done, however, in any of several canoes built during our stay on the island."

lee platform on the side opposite the outrigger
forked heads at the top of both end-posts
two outrigger booms, curving downward
outrigger float attached to booms by crotch-shaped Y connectives and cord brace made up of multiple lashing. (A difference here is that in Ifalik the connectives are not pointed and driven into the float, but flat-ended, and carefully fitted to press against it. These connectives take only stresses that push the float toward the booms. Stresses that pull float and booms apart are taken by the cord brace.)

The characteristic of the 'flying proa' elsewhere which is not shared by Ifalik canoes is asymmetry of the hull. In the classic 'flying proa' type, Haddon and Hornell say, 'one side, the weather or outrigger side, is more rounding or fuller than the lee side.' As will appear in the account of drawing lines to guide the shaping of the hull, Ifalik hulls are carefully made symmetrical, longitudinally and transversely."

(1947-48)

"In construction of hull and attachment of outrigger, canoes of all sizes are essentially alike. The small rosemāni have no thwarts except for the inboard portions of the two booms, while larger canoes have additional thwarts nearer each end. All canoes carry paddles (fatole) and wooden scoop-shaped bailers (mat). Paddling canoes are poled in shallow water. When not in use, the poles are laid over the booms just [53] outside the hull, and kept in place by sennit loops (taninga ni meinin) near each end. Wooden trays (tarong) rest on the booms just outside the hull, and are attached by lashing. They are used to carry small articles, which are more likely to stay dry there than inside the hull. In sailing canoes, these are replaced by large platforms (Fig. 7, d, e), not only on the outrigger side but on the lee side as well.

Large canoes conform in every respect but one--symmetry of the hull on Ifalik--to the 'flying proa' type described by Haddon and Hornell in 'Canoes of Oceania'* as characteristic of the western Carolines. Characteristics of that type which are present in Ifalik canoes are:

triangular outrigger platform

"* Throughout the following account, the terminology in English follows that of Haddon and Hornell."

"Details of construction were recorded by Sarfert and Damm and, following them, by Haddon and Hornell. What additions can be made here will be given mostly in the accompanying figures. The following account will emphasize the process of building a canoe and its supernatural sanctions. The membership of the working parties, and the obligations which bring them to the job and keep them on it, will be discussed in the chapter on economics.

The fine point in construction of the hull is the drawing of lines to ensure its being hewn to a symmetrical shape. Tom said: 'Suppose some man savvy chop, no savvy line; he no savvy carpenter.' The origin of the lore of drawing lines is explained in the following myth. [KS: See category 539] This is one of several versions of one of the most popular tales about the sky-dwellers. In this one the building of a new type of canoe is emphasized. What is the climax in two other versions (one collected by Spiro, the other embodied in a song) is omitted here--details of how Galēt, by reawaking his wife's passion for him, induced her to follow him back home. All the characters are supernatural beings, though they behave much like human islanders.

HOW SEIMELIGARĀRA TAUGHT CANOE-BUILDING TO SEILANGI

Galēt was very sad because he could not see his wife. He was living in the Men's House, while she, GanauliwIr, was in her mother's house. He did no work, staying

inside his mosquito net. Food was brought to him there. GanauliwIr, too, stayed inside the mosquito net in her mother's house. [54]

Then Virar came, and took GanauliwIr away with him to Ulimatau.

Galet had two brothers, Wëtreilök and Uterang. Wëtreilök was the husband of Seramaliwök, sister of GanauliwIr.

Wëtreilök said to his wife 'I am going to talk to Galēt. Then we will go bathing together. While we are in the water, you come past, dressed in your best clothes.'

Seramaliwök made ready, putting on a new skirt, flowers in her hair, and red turmeric paint on her face and body.

Wëtreilök went to the Men's House and called to Galēt, who was asleep in his mosquito net.

'Wake up, Galēt! Your wife is gone! Virar took her away!'

He persuaded Galēt that the first thing to do was to go bathing.

While they were in the water, Seramaliwök came by in all her finery.

'Oh, look!' Galēt cried. 'There is the wife for me!'

'Never mind that one', Wëtreilök replied. 'She is my wife. But she is nothing compared to her sister. I mean GanauliwIr, the wife that Virar took away from you.'

'Is GanauliwIr as beautiful as all that?'

'Indeed she is.'

The thought of losing such a beautiful woman made Galēt furious. He blew his whistle,

until people said 'What's the matter with Galēt?' He took a stick and began to wreck the Men's House.

His father, the chief, tried to console him by summoning all the women, so that Galēt might look them over and choose the one he liked best to be his new wife. When they came, there was one that Galēt thought he liked very much.

But Wētreilok told him 'Oh, she is nothing like so beautiful as the one you had before.'

Galēt broke out again in fury. He blew his whistle, took his stick, and began to wreck his father's house.

Then he decided to have a canoe made, so that he could go to Ulimatau and try to get his wife back. The work was in charge of Seimeligarāra, who had studied the art of canoe-building with Seilangi and Wolfat. He made a canoe in the most approved style of the time. But Galēt did not like it.

'What kind of canoe would you like?'

'Oh, I want something different.'

Seimeligarāra went to Seilangi and asked 'What kinds of canoes can you make?' [55]

Seilangi said 'Only the one kind, like all those we have here.'

'Well just you wait. I'm going to make something different.'

So Seimeligarāra went to work and made a canoe with a special kind of forked end (metaliwā). The fork had a wide, round opening instead of a pointed one. Moreover, he painted the inner curve of the fork white; the outer half, black, instead of making it

black all over. When it was launched it looked very fine, and proved to be a fast sailer. Galēt was greatly pleased with it,

Galēt said 'Now I am going to Ulimatau to get my wife. Who is going with me?'

His two brothers, Wëtreilok and Uterang, went with him; also Wëtreilok's wife, Seramailowok.

Galēt took the sheet. Uterang went aft and took the wheel. Wëtreilok went below and manned the pump.*

Seramaliwok lay on the platform over the outrigger, under the pandanus shelter (gaimwemwe). Galēt had had this rigged so that it opened toward the hull of the canoe instead of away from it, as is usual. This was so that he could look at Seramaliwok.

During the voyage Galēt flirted with Seramaliwok, and at last put his finger in her genitals.

Wëtreilok, down in the hull, smelled the discharge, but went on working the pump.**

"* Tom said 'wheel' and 'pump', although in an Ifalik canoe, to this day, steering is done by a steering paddle, and bailing by a wooden bailer.

** This bit of obscenity, which has nothing to do with the rest of the story, unless to emphasize Galēt's passionate nature, seems to be introduced for humorous effect. I took it down solemnly, but found out later that a more acceptable response would have been uproarious laughter."

They reached Ulimatau and took down sail and mast.

Seramaliwok went ashore and found her sister, GanauliwIr, in the house of Virar.

'Where is your husband?'

'He is out in the bush, putting pandanus leaves around the trunks of the coconut trees so that the rats can't climb them and eat the young coconuts.'

'I have come to take you with me.'

'Where?'

'To see your old husband, and decide whether you like him best.'

'All right. But the husband I have now is a wonderful man. There is no-one like him.'

'Still, you'd better come and see the old one again.'

When GanauliwIr saw Galēt, the husband she had deserted, she decided at once that she loved him best, and got in the canoe with him and went back to Ururial.

(At this point in other versions comes an account of a dance in which Galēt wins [56] back his wife's love; and on the return journey, instead of going in a canoe, she follows him as he walks on the waves.)

After the canoe he built had made such a successful voyage, Seimeligarāra went to Seilangi and offered to teach him canoe-building. He said he was willing to do this because he, Seimeligarāra, did not have enough people to work for him, while Seilangi had plenty.

So Seimeligarāra taught Seilangi the art of the measuring-line. If you use it rightly,

the canoe will be fast in the water. If you don't use it, but rely on your eye and the adz, the canoe will be very slow. Seimeligarāra taught Seilangi all the proper measurements.

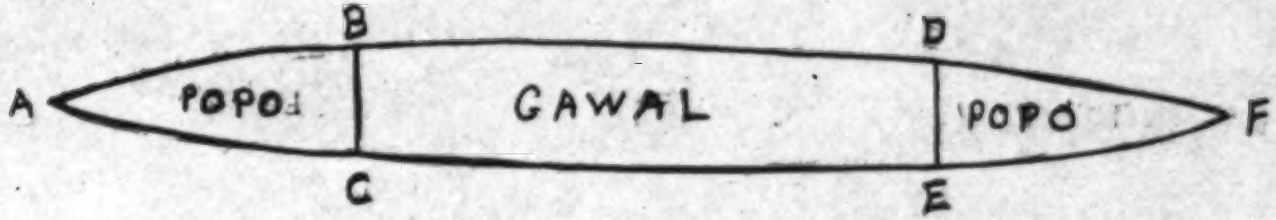
Seilangi went to work on a canoe. Whenever he had any doubts or difficulties, he took them to Seimeligarāra. Seimeligarāra taught him how to shape the bottom of the canoe, how to shape and measure the sail, and how to make holes in the outrigger float to tie it to the booms.

Seilangi taught the art of the line to SemerIk. From these three it spread among the gods. People down on earth asked the three gods to descend and teach them the art. The gods came down, so now people know how to shape a canoe.

In this story the special shape of forked end made by Seimeligarāra evidently symbolizes the whole art of shaping a hull by means of lines. The forked end is called metali wā, face or eye of the canoe. The particular shape introduced by Seimeligarāra is called pōpō, the name used by Haddon and Hornell (from what source is not stated) for the type of 'flying proa' used throughout the region. On Ifalik pōpō is also the name of the two end sections of the underbody. The Hamburg expedition obtained a model canoe on Ifalik with this kind of forked end. Its name, they were told, was gauat, and there had been one on Ifalik until the typhoon of 1907. Tom said that in Ifalik a carpenter might

still build a canoe of pōpō type if he wanted to, and that there were many in some other islands. In a version of the Galēt story collected by Spiro, without native text, the peculiarity of the canoe built by Seimeligarāra for Galēt is that the hull 'turns at an angle.' Conceivably this could be a way of describing an asymmetric hull. However that may be, at present the story serves on Ifalik as a mythological charter for the practice of drawing lines on a canoe hull so that it can be hewn into a symmetrical shape."

(1947-48)



"Fig. 10. -First measurements on the bottom of a canoe.

ABDF is the top of the log, which will be the bottom of the hull. It is called arol. BC and DE are the dividing lines between the end sections, called pōpō, and the middle section, called gawal. The gawal is one half the total length; each of the pōpō one quarter. The dividing points B and D are called annetok."

"Fig. 9. -Two types of forked head (metaliwā) for the ends of a canoe.

a, the type called kawalu, used on Ifalik.
b, the type called pōpō, attributed to Seimeligarāra."

1: Burrows--56 (1947-48) Woleaians
116, 396, 173 Ifalik

"Damm's account, based on Sarfert's visit, mentions a myth which attributes the first canoe to Seilangi. The only further detail is that he brought the art down to mankind on the island 'Modj', four days' journey south of Truk. Damm identifies this island with Modj (on our charts More) in the atoll Satawan in the Nomoi or Mortlock group. No point of origin was known to my informants."

1: Burrows--56-57 (1947-48) Woleaians
116, 396 Ifalik

"The first day in canoe building which is regarded as of vital importance is that on which the bottom is first measured off. The tree has already been selected and felled, the log for the underbody roughed out and hauled to the canoe-house where the work is to be done. On the morning of the day when the first lines are to be drawn, the workers may not touch food, except for a drink of fresh coconut toddy. [57]

Before beginning the work, the carpenter takes a coconut and offers it to the gods Seimeligarāra, Seilangi, and SemerIk, with the following prayer. (The English words for the first line seem to be a paraphrase rather than a translation.)

Eia ngalir tautou,	Gods of the carpenter
Tautou bwo li valval,	Carpenter of the measuring-line,
E bwe gatre tipal.	He will be happy.

Tom said this was the whole text of the prayer, but explained that the carpenter was going to be happy because his canoe would be light and fast, and would not sink.

The instruments used for measuring are a sennit line (tal ni valval), a flexible ruler (tageluvā) made of a strip of coconut leaf midrib, a bit of leaflet midrib for measuring short spaces, a pot of red paint and a wooden pen or marker."

1: Burrows--57 (1947-48) Woleaians
116, 396 Ifalik

"First the length of the bottom is measured off with the line. Then its middle point is found by doubling the line. The line is redoubled, giving a length one quarter of the total. This quarter distance is measured off from each end and marked. This divides the bottom into three parts. The two at the ends, called pōpō, are a quarter of the total length; the one in the middle, called gawal, half of the total. The bottom is to be curved along the pōpō, straight (or nearly so) along the gawal. This ensures that the two curving ends shall be of the same length.

Next a double line is stretched along the median line of the bottom (ABDF in the figure). With ruler and paint, lines are drawn on each side of it. Lines are then drawn with the ruler on each side of the median line. (ACEF in the figure represents one of them). The distances BC and DE and the corresponding ones on the other side, are carefully measured with a strip of leaflet midrib to make sure that they are all equal. This ensures symmetry of the underbody (pongo) at this stage, both longitudinally and transversely.

The master carpenter then gives permission for the workers to break their fast. They may now drink young coconut, and eat its soft flesh."

1: Burrows--57 (1947-48) Woleaians
116, 396 Ifalik

"Next the bottom is hewn to shape. As the lines are chipped off with the adzes, new ones are drawn on. At a later stage it is customary to have five lines on each side. The principle is the same as with the first two; to keep them equidistant throughout their length, so that the hull will be symmetrical in both dimensions. This is said to ensure its sailing straight and fast.

When the underbody is finished except for final touches, it is turned right side up. Occasionally the builder of a small canoe will be able to get a log big enough to make the hull, except for the end-posts, all in one piece. Such a canoe is called wā velanū. All the larger canoes, though, and most of the small ones, have their sides built up with planks (pape).

The underbody is hollowed out for the sake of lightness, except that several triangular spreaders (vailō) are left intact to keep the flaring sides from collapsing. A joint is cut in each end, at a somewhat acute angle, to take the lower end of an end-post."

1: Burrows-58 (1947-48) Woleaians
116, 396 Ifalik

"The technique of fitting two pieces together, which begins with joining the parts of the forked head or, if that is all in one piece, with joining the end-post to the underbody, is always the same. It is a very slow one, requiring repeated trial fittings. The two parts to be fitted together are first shaped by eye; and the eye is such a practised one, in the case of experienced canoe-carpenters, that an approximate fit is achieved at once. But hardly ever can it be good enough to make a watertight joint. So the joining surface of one of the pieces--always the lower one, on the piece first put in place as the canoe is built up--is daubed with red paint. The other piece is then lifted into place, with its joining surface against the fresh paint. Any protrusions, which widen the joint, take the paint, and show the carpenters where more wood has to be taken off. After the reddened bits of surface have been removed, and any other changes indicated by the fitting completed, the upper piece is tried on again. The process is repeated until the joint is satisfactorily tight at every point. This task, which is repeated for every piece in the hull where two surfaces are to be in contact, goes very slowly, with many pauses for consultation and rest. Only a few men--two to four seems a usual number--stay on the job through this stage."

1: Burrows--58 (1947-48) Woleaians
116, 396 Ifalik

"Next the end-pieces (par) are hewn out. Though much smaller than the underbody, they must take the brunt of any end-on collision. So they are made of hard, tough wood, usually rages. They are the only pieces in the hull to be made of other wood than breadfruit, though hardwoods are also used for the masthead and several parts of the outrigger and platforms.

Each end-piece is trimmed to form a cutwater (vetang) as sharp as it can be without weakening it too much. Even in the largest canoes, the cutwater is usually less than an inch wide. The inboard side is hollowed out, leaving two or three triangular spreaders, as in the underbody. The one that will come at the height of the gunwales has a special name, ta li vetvet. A shallow round pit or socket is cut in its upper surface. This holds the apex of the sail, when that end is the bow; and supports the butt of a fishing-pole when the end is the stern and the canoe is being used for trolling. The forked head, the shape of which has already been discussed, is hewn out of the solid top of each end-piece; or, if wood is lacking for part of the fork on one side or both, separate pieces are shaped and fastened on. Finally, the bottom of each end-piece is cut to fit the joint cut in one end of the underbody. The post must set at such an angle as to give the overhang characteristic of all Ifalik canoes."

1: Burrows--58 (1947-48) Woleaians
116, 396 Ifalik

"When each joint [KS: of a canoe] is made satisfactorily tight, holes are bored at corresponding points in the two surfaces. Then the two are sewed together, with sennit cord. The leading end of the cord is stiffened, for pushing through the hole, by tying it to a makeshift bodkin or eyeless needle, which consists of a slender strip or splinter cut off a coconut leaf midrib. The cord is passed round and round through each hole; but the technique is strictly sewing rather than lashing, as it is sometimes called, because the cord passes through the planks rather than around them. The first attachment is only temporary.

With the end-pieces in place, breadfruit planks are hewn out of the biggest pieces available, and fitted and sewed together by the processes just described. Wood is so scarce that even wormeaten pieces are used, and patched if necessary. The joints between planks take whatever shape--usually a very irregular one--will waste the least wood. In this way the hull is built up to the size desired, or that dictated by the available timber."

1: Burrows--59 (1947-48) Woleaians
116, 396 Ifalik

"No ribs or inner framework stiffen the hull as a whole. Such a vessel, made of planks simply sewn together edge to edge, seems very flimsy. And, indeed, there is always danger, in a heavy sea, that the hull may be crushed or broken apart. Yet several devices help to strengthen it. The little triangular spreaders left in place in hewing out the underbody and end-posts have that effect, as far as they go. Broad gunwales (mesāp), laid flat, surmount both sides, stiffening them as well as turning aside some of the water that would otherwise splash in. The two outrigger booms, running athwart the hull amidships, are perhaps the strongest braces of all. The little rosemani, which keep to the lagoon except in calm weather, have no other thwarts than these. Larger canoes have several, the number varying with their size. Those nearest the bow and stern of sailing canoes have a special name (metangār) and an additional function They project beyond the hull, and end in knobs. When the mast is up, the halyards are made fast to these projections, and the knobs keep them from slipping off.

These stiffening devices are most effective against inward stresses that threaten to crush the hull. Against outward stresses, so communicated from one member to another that they threaten to spread the hull apart, there is less protection. As a last resort a rope may be slung about a canoe at sea, to hold the hull together. Not everyone knows how to do this; in fact, the purpose of a song in which I first heard it mentioned was to shame a crew of young men who had let their canoe break apart on a sand-spit because they did not know how to rope it together."

1: Burrows--59 (1947-48) Woleaians
116, 396 Ifalik

"When all the pieces of the hull have been hewn to shape and fitted together, there is another burst of work, requiring a considerable number of men. The hull is taken apart, a few chips hewn off here and there to make the joints fit better, then it is all put together again, this time permanently. The joints are tightened with thin strips that act like caulking, though they are laid in place, not driven in. The seams are glued; and the lashing is replaced more carefully than before. At this point in the building of Tom's canoe, 31 men were counted in the canoe-house, though there were rarely more than 10 working at any one time.

The strips that correspond to caulking are made of the husk of mature coconuts, skillfully cut in very thin slices (päle). Sometimes, it is said, dried moss may be used instead; but coconut husk is preferred for the best canoes.

Over the caulking is spread a glue of breadfruit gum (bwIIIs). The gum collects on slashes made in the bark and outer wood of the trunk. It is kept, nowadays, in glass bottles. To remove it for use, a stick is thrust into the bottle. When withdrawn, it pulls out after it a white rope of gum. This is wound on the stick in a ball. Before applying, it is heated with a torch (kal) of coconut spathes. Thus softened, it comes off on the caulking in a thin, even sheet."

1: Burrows--60 (1947-48) Woleaians
116, 396 Ifalik

"The next crucial point is the attachment of the outrigger float (tam). This is considered a particularly delicate and difficult task. On the day when it is done, the workmen again eat nothing in the morning, --this time not even toddy. Four forked sticks (iam) form the Y or crutch connectives. The insides of the forks are carefully fitted to the booms to make as tight a joint as possible. Their lower ends are also fitted with great care to the upper surface of the float. On each boom, one fork presses against the inboard angle of this surface, the other against the outboard angle. They are not fastened at this end in any way.

A number of other pieces are added to strengthen the outrigger attachment. A yoke (wā lieng) connects the two booms between the inner and outer pairs of crutches. Just inboard from the inner pair of crutches, another spar (sosoā) connects the two booms. Riri fern leaves are tied on with the lashing that attaches this brace. These leaves are thought to ensure the presence of fish whenever the canoe goes out after them. If the leaves were omitted, there would be fish sometimes, but not always. The fact that fish are not always found even when this requirement has been met does not seem to disturb anyone's faith. The structure is further braced by means of light struts which run diagonally from the outer side of each boom to the outer sides of each pair of crutches. Another light stick connects the lower side of the booms at the upper ends of these struts; still another connects the two outboard crutches at the lower end of the struts. These pieces are very small, usually less than 1/2 inch in diameter; but they are made

of the strongest kinds of wood, commonly gaingei. Thus the outrigger attachment is braced and reinforced against stress in almost any direction, while the lashing, and at some points the elasticity of the wood, allow the structure to give a little without breaking. The crutches and their bracing serve to keep booms and float at the proper distance from each other. The float is fastened to the rest of the structure solely by stout rope lashing (Fig. 1, 2). It can be quickly and easily detached by simply undoing these ropes; and this is often done, to save space and strain, when a canoe is stowed in the canoe-house.

The light platform on the outrigger booms is built next. As this involves no new techniques, the details shown in Fig. 12 seem sufficient. The same is true of the lee platform shown in Fig. 13.

When all but the rigging [KS: of a canoe] is in place, the final lashing is put in, more tightly and carefully than the others. Wherever any appreciable length of lashing is exposed, it is protected by seizing. The holes in the hull, through which the lashings run, are filled with a putty or mortar made of coral lime mixed with charcoal from burned coconut husks. The charcoal is said to give the mixture strength."

1: Burrows--61 (1947-48) Woleaians
116, 396 Ifalik

"The finished strips are brought to the men. They lay out the gaff and boom on a level piece of ground, usually in front of the canoe-house, at what is judged to be the angle they will take when the sail is finished. The strips of matting are laid in place, according to length, parallel to the gaff and with an inch or two of overlap. Then they are sewed together with light sennit lines. Not only are seams sewed where the strips join, but the whole is strengthened by other lines of stitching run across at right angles. Foreign sailmakers' needles of copper or brass are used for this work. Most of the stitches are several inches long.

It would be perfectly feasible to plait a sail in one piece. But a sail made of strips has several advantages. It is stronger, because of the double width along the seams. When a tear does start, it is apt to be confined to one strip. And such a tear, or worn place, can be easily repaired by replacing one strip, or part of one.

As soon as the rigging is ready, the canoe is carried into the water and launched. It is taken for a trial run (gaterax), to see how it performs under sail. First it is paddled out to where it can catch the wind, then the mast is stepped and the sail hoisted for the first time."

1: Burrows--59-60 (1947-48) Woleaians
116, 396 Ifalik

"Taking the hull apart, caulking it, and re-assembling it, constitute a full day's work, though taken at a much faster pace than the leisurely one used in fitting planks together. About midday the owner of the canoe feasts the workmen on breadfruit or taro in coconut cream, which is usually all he has to offer.

Although this is a day of great activity it is not taken as solemnly as the days of more delicate, risky tasks. The workmen are not subjected to any tapus [sic] and the only ritual performed is a short prayer and offering a bit of food just before the men begin to eat. This is customary at any distribution of food to a group larger than a household. [60]

The fitting of gunwales and preparation of the parts of the outrigger make up another slow, careful stage, with only a few men working at a time. The outrigger booms are centered in the hull by measuring its overall length with a sennit line, then doubling the line. At points equidistant from the halfway mark so determined, and about a yard apart, the outrigger booms are fitted into the gunwales. The same measure--half the overall length of the hull--is used for the distance from the middle of the hull to the point on each boom directly over the middle of the outrigger float."

"Fig. 11. -Outrigger attachment.

For the sake of clearness, this diagram omits many details, such as the lashings that bind crutch connectives, yoke, and brace to the boom.

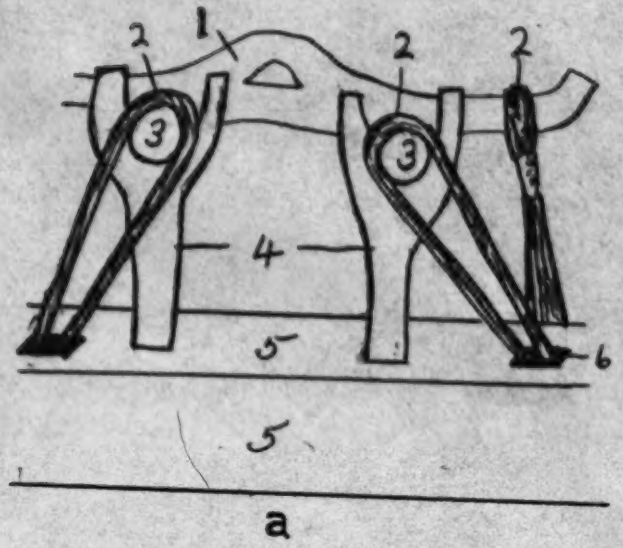
a, from outboard side. (Only the outboard pair of crutch connectives is shown.)

1, yoke (walieng); 2, lashing attaching yoke and booms to float;
3, booms (gio); 4, crutch connectives (amw); 5, float (tam);
6, holes in float through which lashings pass.

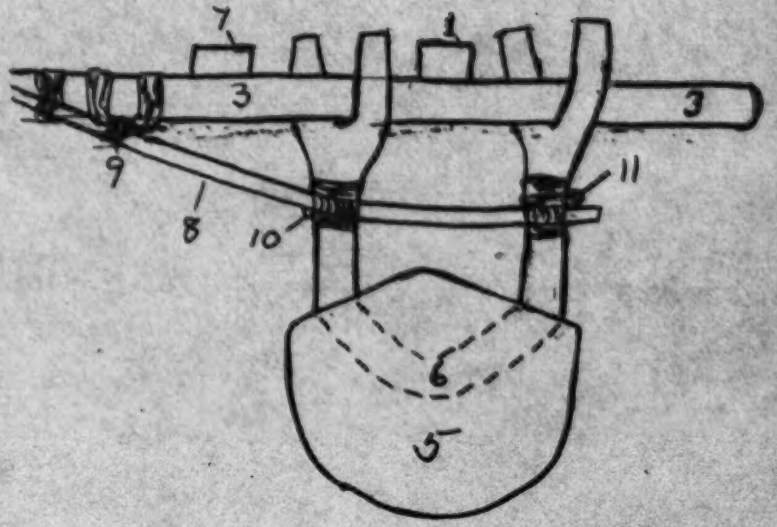
b, end view. (Only one boom, with the inboard and outboard connectives and strut attached to it, are shown.)

Numbers designate the same parts as in (a), with the following additions:
7, brace; 8, strut (rege); 9, light brace between booms;
10, light brace between inboard connectives; 11, light brace between outboard connectives."

"Fig. 11. -Outrigger attachment." See next page.



a



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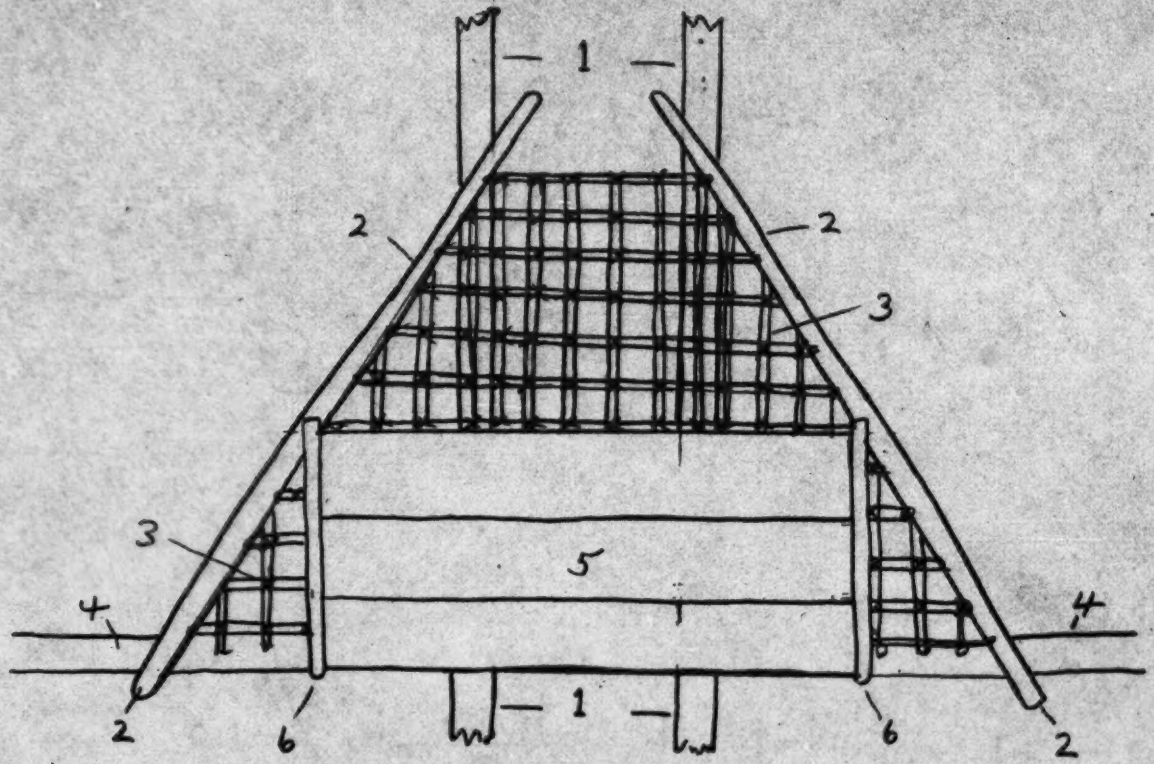


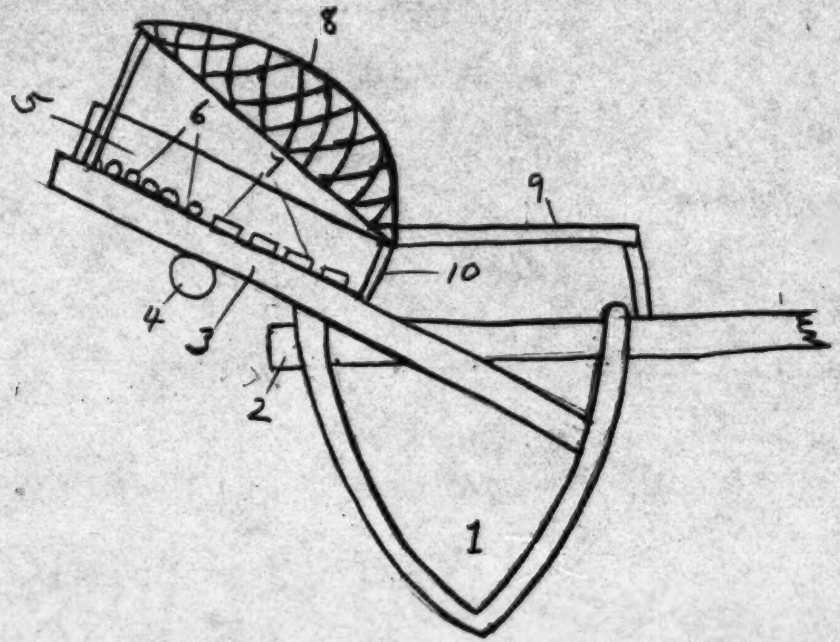
"Fig. 12. -Outrigger platform." See adjoining page.

1: Burrows--60-C
116, 396, 501

(1947-48)

Woleaians
Ifalik 1-2

"Fig. 13. -Lee platform (pep)." See next page.



1: Burrows--60-B (1947-48) Woleaians-2
116, 396, 501 Ifalik

"Fig. 12. -Outrigger platform.

1, booms; 2, diagonal spars (metare vang) between booms and gunwales;
3, withe platform (vang), spaced to show lower layer of transverse withes.
(Actually they are laid so close together that the lower layer does not show);
4, gunwales; 5, plank platform (peraf);
6, shaped upright planks (mwale maor) at forward and after ends of plank platform."

"Fig. 13. -Lee platform (pep).

1, hull; 2, boom; 3, supporting spar. There is one supporting spar at each end of the platform; only the nearer one is shown. Midway between them is a squared beam, not shown, which forms an additional support to the platform but does not extend across the hull. It is called outeni i pep.
4, longitudinal spar (walieng); 5, end frame piece (pal i pep; only the farther one is shown);
6, withes forming floor of outer part of platform (fang i li pep); 7, slats forming floor of inner part of platform (ujili i li pep); 8, pandanus-leaf roof or shelter over platform (gaimwemwe; this consists of whole pandanus leaves, overlapping, laid over a light frame of withes lashed together. A top layer of sennit netting prevents the leaves from being torn off by the wind); 9, transverse board (folak; there is one at each end of the platform; only the farther one is shown); 10, inboard frame place (weliwā)."

1: Burrows--60-61 (1947-48) Woleaians
116, 396 Ifalik

"The shaping of the mast (gaus) is once more a task for one or two men. The mast is made in two pieces, a main spar of soft wood and an extension or masthead (mer e li gaus or just mer) of hard wood. Logs that drift ashore from the east, and are said to come from America, furnish the favorite material for the main spar. The masthead is [61] attached to the main spar by lashing over a long diagonal joint. At the top it is finished off in diamond shape, like a blunt spearhead. This part is broader and flatter than the rest. Through its center is cut a hole, which serves instead of block or pully to take the halyard that hoists and lowers the sail. As the sail is suspended from this halyard, the pull of the wind comes against one side of the hole in the masthead. The stress would be too great for a soft or easily-split wood. That is why the masthead is a separate piece, of the toughest wood available. The favorite wood is ragēs.

Long, light spars (irañū) are prepared for two of the three sides of the sail. In most cases they are pieced together with the same kind of long, diagonal lashed joint as that used to join the two pieces of the mast. Most of the spars have a slight double curve, like an extremely flat 's'. Hence the sail, instead of being a rectilinear triangle, flares out a little, from the apex toward the after side, where there is no spar. This shape of spar seems to be deliberately preferred; whether simply as a matter of traditional taste, or because of some real or supposed advantage in the flare that it gives to the sail, is not clear."

1: Burrows--61 (1947-48) Woleaians
116, 396 Ifalik

"Meanwhile women have been making one of their two contributions to the construction of the canoe--plaiting strips of mat for the sail. (The other is the indirect one of supplying food to the workers.) The strips are about a foot wide, of unbleached pandanus leaf, plaited in simple check with wefts about one quarter inch wide. In length the strips vary from one nearly the full length of the forward spar or gaff, to one only a little longer than it is wide. All will be attached at one end to the lower spar or boom. The other end will form a selvage along the open or after side of the sail. The longest strip will be attached along one side to the upper spar or yard. Each successive strip, counting from this side, is shorter until the last one, at the corner where boom and open side meet, shows as a triangle. Except for overlap, it is only about as long as it is wide on the forward side, and comes down to a point on the after corner.

The length of the largest strip is determined, then, by the length of the yard; the number of strips by the length of the boom. The length of each succeeding strip, as they taper off, is worked out by trial and discussion among all concerned. There is no formal position of master sailmaker among the women, but the ranking member of each working party, according to seniority and experience, is accorded some deference."

(1947-48)

"The heel of the mast is set into a socket cut in a block on the outrigger platform, just amidships and directly over the gunwale on the outrigger or weather side. (This side is called palietam; the lee side, igetā.) The sail is hoisted by hauling on the peak halyard that runs through the masthead and is fastened to the yard on the upper long side of the sail. The mast is tilted forward until the apex of the sail settles into a socket cut for it in the wedge-shaped brace (ta li vetvet) on the inboard side of the end-post, at the height of the gunwales. This corner of the sail is made fast by means of a short line or tack. From this point the lower spar or boom rises at an angle, so that the short side of the sail, the one without a spar, is highest and farthest aft.

The mast [KS: of a canoe] is supported to windward by a shroud running from the masthead to a hole in the middle of the yoke which connects the two outrigger booms directly over the float. For and aft it is supported by a running stay attached in the middle to the masthead and at the ends to the projecting endmost thwarts. The sail is let in and out by a sheet attached to the boom, much as in sails of European type. To shorten sail in case a squall threatens to capsize the canoe, the boom can be raised by means of

spilling lines reeved through the masthead. *

In order to change to the other tack in beating to windward, or to make any sharp turn of more than a right angle, the canoe does not go about like European sailing craft, but changes ends. This is quickly done, while the canoe swings toward the new direction, by the following procedure: raising the boom to shorten sail, unfastening the apex of the sail, swinging the sail around the mast to leeward, and stepping the apex in the other end. This converts what was the stern into the bow. The steersman takes his post in what was the bow, which now becomes the stern. The boom is lowered, the sheet let out. The sail catches the wind, and the canoe moves off in the new direction. Obviously, the reason for this procedure is to keep the outrigger on the windward side, and so balance the vessel against the sidewise pressure of wind on the sail."

"* This rig is shown, more clearly than words can do it, in some of the illustrations in Haddon and Hornell; particularly Vol. 1, Figs. 269 and 270. Fig. 268 shows more clearly the shroud from masthead to yoke, but the sail is either in the wrong position or is of a different type from that used in Ifalik. Abb. 150 on p. 53 of Damm's book shows how some of the lines are attached to the mast. But the artist who redrew Sarfert's sketch made the mast too long and the apex of the sail too high, like a European lateen, rather than an Oceanic one."

1: Burrows--62-63 (1947-48) Woleaians
116, 396 Ifalik

"For maneuvering in shallow water, sailing canoes use the same equipment as small paddling canoes; paddles and even poles, though poles are rather for staving off coral heads than for propulsion, as the large canoes avoid water shallow enough for poling. The paddles have round, straight shafts, without knobs or other elaborations at the top, and lanceolate blades. These taper symmetrically from a low ridge along the middle to thin edges. At the tip, in most paddles, the middle ridge is extended and slightly expanded (Fig. 14, c.) The protruding knob or spike helps to prevent the blade from splitting when the paddle is used for poling or staving off an obstacle; though such use is avoided, if there is time to seize a pole.

In open sea, canoes are kept on their course by a quarter rudder (Fig. 14, b.) It is shipped near the stern on the leeward side. The line through the hole in its upper part is made fast to the projection of the stern thwart on the opposite side. The direction of the blade is regulated by the handle. To hold the lower part of the blade against the side of the canoe, the steersman has to sit on the gunwale with one leg over the side. For this reason, steering at sea is an awkward and strenuous task. [63]

The quarter rudder not only steers the canoe, but cuts down drift like the sideboards sometimes fitted to small canoes in the United States when they are sailed."

the outrigger booms, where little decorations or attempts at writing may be painted. Tom's choice for this part of his canoe was an American flag.

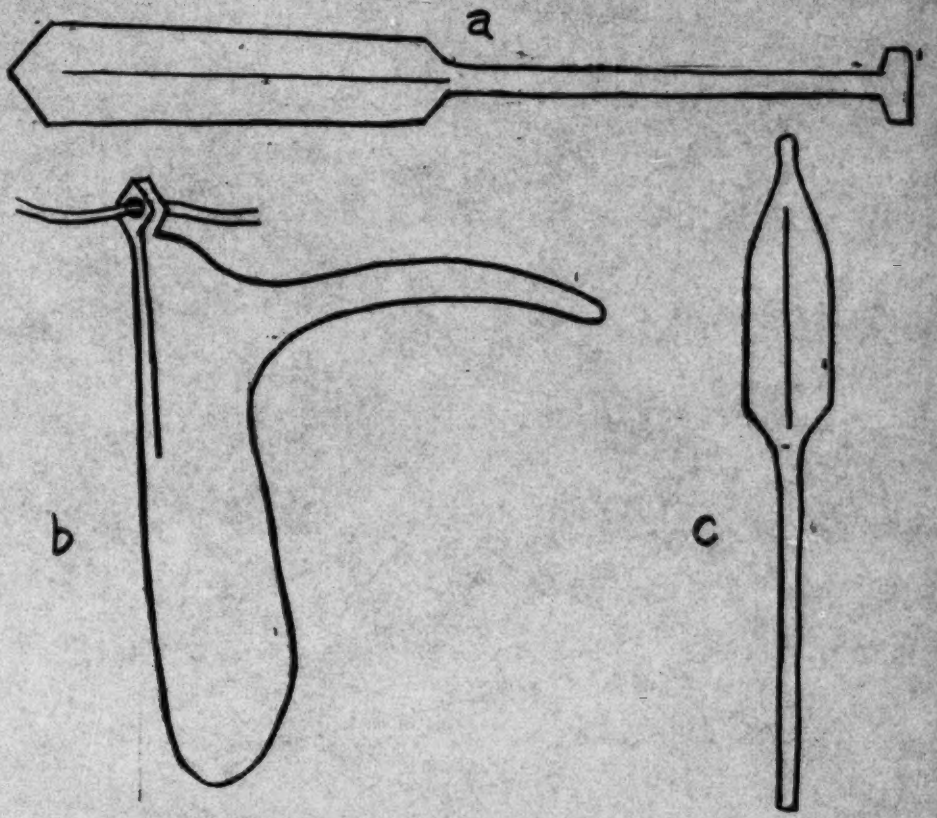
The pigments used nowadays [KS: for painting canoes] are bought from foreign ships; but the red, which is the first put on and apparently the most prized, is still mixed with breadfruit gum. If my informants can be trusted as to the pigment formerly used, it was bark of the rel tree soaked in water and mixed with coral lime. When this red paint is being applied, one of the huge leaves of the giant arum (filē) is suspended over the hull. This can hardly be anything but a bit of magic or ritual or[sic] ensure success of the job, or of the canoe after it is finished. But Tom could not explain its symbolism. He fell back on his usual statement about traditional practises whose meaning had been forgotten--'blong before.'

No part of the outrigger is ever painted. Pestered again with the inevitable 'Why?', Tom at first parried with 'blong before.' After thinking it over, he suggested that the paint might be too heavy. We were talking especially about the float, and this suggestion at least reflects native insistence that the float must be light; so light that the wood of only two of the nine varieties of breadfruit is considered suitable for it."

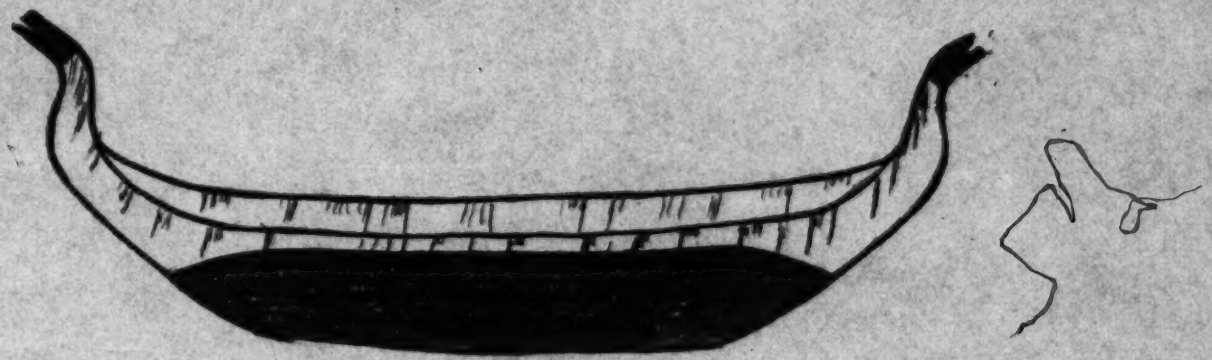
1: Burrows--63-A
116, 396, 501

(1947-48)

Woleaians
Ifalik



"Fig. 14. - a, steering paddle;
b, quarter rudder;
c, paddle."



"Fig. 15. -Traditional design for painting a canoe.

The colors are red, black, and white. Portions painted in red are shown by shading. The little panels of white, outlined with black, are called rajūm; the red portion (perhaps only the wide parts of it near bow and stern?), mētegal; the black line through the middle of the red, fare; the narrow lower strip of red, lanīlap; the boundary between red and lower black, meteitralo; and the black under portion, amīs."

1: Burrows--117 (1947-48) Woleaians
116, 396, 226, 466 Ifalik

"As to direction of labor, final authority over every job of concern to more than one household rests with the chiefs. All such jobs, like district fishing parties, repairing a canoe-house, or a general clean-up, are undertaken at their order. But it was only during the bonito drives that chiefs were seen to assume active command.

The building of a large sailing canoe requires permission of the chiefs, presumably because it makes such inroads on the available manpower. The course of the work itself is under the direction of an expert shipwright, who may or may not also be a chief. Tom, as a sennap, was nominally in charge of the building of his canoe. But since his time had been allotted by the chiefs to Spiro and me, he delegated supervision of the work on the canoe to his brother, Magaleisei, also a sennap.

An observer who had not been told in advance who was in charge of a job would ordinarily have difficulty in picking him out. The only tasks in which a boss was clearly in evidence, within my observation, were the drawing of lines on what was to be the bottom of a canoe, and the hurried launching that followed the sighting of a school of bonito in the lagoon. The drawing of lines has to be constantly, narrowly supervised. The sighting of a school of bonito is a crucial moment and calls for utmost haste. On the two occasions when we witnessed it, the usually mild Maroligar came hobbling to the canoe-house at the best speed he could make, bawling orders at the top of his voice, his eyes blazing."

"The hulls have a total height of four or five feet, and when loaded draw from two to, at most, three feet of water. Lacking a keel, or even the flattened leeward side of some other Micronesian canoes, they can sail close to the wind, and drift rather badly. This seems to be the main weakness of the canoes, otherwise admirably fast under sail, and seaworthy for their size. One of the chief worries of a native navigator is that he may drift off his course unless he has a following wind, and miss entirely the small, low island which is the only destination he can have within three or four hundred miles of Ifalik.

Unless the trial run indicates the need of some further work or readjustments on the canoe--none were necessary on Tom's masterpiece--the permanent lashing (or sewing) is at last put in, and the hull painted. This is the final step in making a canoe. It is always done in red, black, and white, according to the traditional design shown in Fig. 15. This design was part of the traditional lore of canoe-making brought down to men by the gods Seilangi and Semerik. If ever an Ifalik man seriously considers painting a canoe in any other way, the mentality of the island will be very different from what it was in 1948. No tabu against painting a canoe in some other design, nor penalty for doing so, was ever mentioned. It did not have to be. No such idea ever comes up. There is only one right way to paint a canoe, so, of course, they are all painted that way. There is scope for individual fancy at only one point: the middle of the upper red band, between

"In building a canoe, the sharing of authority was even more evident. [118] It often happened, in the job we had a chance to follow from day to day, that more than one recognized expert was working at a time. One of them, Toromann, was also a chief; but another, Magaleisei, was nominally in charge. Neither distinction could have been guessed from their behavior. There was no jockeying for precedence, as might be expected in our culture unless a rigid order of precedence was observed. Everybody felt free to sight along a line and give his opinion about it. There were frequent pauses for consultation. Nobody seemed to be criticizing anybody else, or defending himself against criticism.

That sort of divided command is obviously inefficient. Yet it has an advantage rarely attained in modern American culture. Every worker gets far more fun out of his work than he could by taking orders from a foreman, who in turn follows a blueprint. In the Ifalik way of working, everybody shares in the joys of feeling himself an executive, whether anybody follows his instructions or not. The morale of the workers is enviably high. Add the custom of dressing up in a strip or two of white young coconut leaf at the beginning of a communal job, and celebrating the end of it with a feast, and it will be plain that Ifalik combines work and play more successfully than has been done in our culture since the days of barn-raisings and husking-bees. Ifalik still extends democracy to economic production, a sphere in which we have sacrificed it to speed, quantity and precision."

"In the making of Tom's canoe, the obligations that brought men to the work were of three kinds: (1) kinship; (2) neighborliness; (3) friendship. On the big days, when many hands were needed, all the neighbors rallied round. Most of the workmen seemed to be from Falārlk, where Tom lived and where the work was going on; but there were some from Fauau, and Tom said proudly that some men, not relatives of his, came all the way from Falālap just out of friendship.

Sociability might be added as an additional motive with all hands. On those particular days, that job and the assemblage it brought together probably afforded the best entertainment to be found on the island. And on some of these days there was still another inducement, sometimes held out in our culture in the one word 'refreshments' on notices or invitations. Women of Tom's two households cooked and brought food for the workers.

For the long pull--the many days when only a few workers stayed on the job--the obligation that brought most of them was kinship. The steadiest workers were: (1) Magaleisei, Tom's brother, to whom he had delegated supervision of the work while he was on duty with the visiting anthropologists; (2) the chief Toromann, whose wife is Tom's sister (my records do not make clear whether she is [119] what we would call a sister, or whether Tom used the word in an extended sense, in which case she is what we would call a cousin); (3) Aueligar, Toromann's son, whom Tom would call vatuwei (my sister's son); (4) Siuman, another sister's son; (5) Auilimar, husband of one of

Here it is enough to say that thereafter work on the canoe went more steadily."

(1947-48)

"Some test of how typical the building of Tom's canoe may be is afforded by a lesser job of the same kind that was carried out in January, 1948--the re-lashing of a canoe belonging to Gabwileisei of Rauau district. Gabwileisei, not a sennap himself, called on GauaisIg of Falālap to supervise the job. The two are kinsmen, Tom said. I do not know what the relationship is, beyond the fact that they are not of the same clan, Gabwileisei's clan being Sauwèl, GauaisIg's Kovalū.

On the first day a considerable number of men assembled. GauauisIg brought some with him from Falālap. Most of the men of the neighborhood also appeared. Their obligation, Tom explained, was that whenever that canoe brought in a good catch of fish, they would receive a share of it. Altogether, on that day, there were more men than there was room for about the canoe, so they spelled each other. Husked young drinking nuts were distributed.

Though the job took only about a week, the attendance quickly fell off. Again the faithful few were kinsmen: (1) Arigomar, a sister's son of Gabwileisei; (2) Saralimwan, another sister's son; (3) Magaleisei, whose wife is the daughter of a sister, so that he lives on Gabwileisei's ancestral homestead; and (4) Metagesou, another affinal relative --his wife is related to Gabwileisei, [120] Tom was not sure just how. Old GauaisIg, having got the job organized and under way, did not bother to attend every day.

The pattern seems to be about the same as Tom's canoe. Again neighborliness exerted a perceptible pull, but only kinship kept on pulling men to the job for its whole

duration. Among kinsfolk, sister's son ('true' or classificatory) were again prominent, showing that the avunculate gives a man a stronger claim on the services of his sisters' sons than on other relatives."

1: Burrows--120
116, 396, 476, 621

(1947-48)

Woleaians
Ifalik

"Rethatching or repairing a canoe-house is a district job. All the men of the district, whether the particular canoe-house is their neighborhood club or not, are expected to take part. The women help, too; plaiting some of the thatch-sheets for a thatching job, and cooking food for the modest feast which is the proper conclusion for any public task. Sometimes this feast is served several days after the work itself, in which case another job for the men of the district--a district fishing expedition--may help provide food for it. In these district undertakings the claim of kinship is still perceptible, but is now subordinate to that of locality. Some men who were brought up in the district concerned, but have moved away by marriage to another district, will come back on these occasions to the old neighborhood to help with the work and share in the festivities. Men's dances (ur) are also district undertakings. Particular dances are the specialty of particular districts. For these, too, men who have married out of a district will commonly return, and rehearse and perform for the district in which they grew up."

1: Burrows--183 (1947-48) Woleaians
116, 396, 784 Ifalik

"The morning fast imposed upon builders of a new canoe on the two crucial days of the job--the beginning, when lines are drawn to shape the hull, and the day of attaching the outrigger--is a ritual precaution to ensure that the vessel will sail fast and well. Though explained to me in this positive way, it could as well be put in the negative form usual in discussing taboos. Eating is taboo to the workmen on these two mornings. The penalty of a violation would be failure in their task, to the extent that the canoe would be slow."

2: Damm et al. --52-55
116, 396, 173

(1909) 1938

Woleaians-1-2
Ifaluk

The natives trace their knowledge of boat building back to a mythological origin. Sēlăn constructed the first canoe; he brought this art to the men on Mŏdj Island, which lies a four days journey south from Truk. It is not known who taught the people of Ifaluk how to make canoes. The first settlers of Ifaluk were a man named Mŏdj and his wife, and they came to their new homeland on a raft. But soon after that time, and even while Mŏdj was living, canoes were constructed.

The canoes are made out of bread-fruit wood. First the trees are felled with shell axes, and in this task the brothers and sons of the builder assist him. The king must give his permission for the construction of a large sailing canoe. No particular tabus are attached to this work. Other men help drag the trunks to the canoe house. All the workers sing in rhythm, so that the pulling will be in unison and most effective. [AN: for native text of this work song see source pp. 52 and 54] [54]

. . . the various planks of the boat are carefully joined together and bound tightly. The joints of the planks are caulked with pieces (bále)of coconut husk fiber (bējénne), which are mixed with bread-fruit resin (wílis). Then the holes for the binding are smeared with a mixture of burned coconut fibers and burned coral stone (fáu), which has been crushed. Drawing 147 shows how the planks are painted with red soil from Yap and black coloring, which comes from coconut hulls, that have been burned and then stirred in salt water.

During the canoe building there are four banewan conjurations, and these are always when the lines are drawn in the customary manner. On these days all the workers are tapu. Then, when the boat is finished, there is another conjuration, and a trial trip; while this is going on the men sing a certain song. [55] Coconuts are placed beside the boat during these magic spells; there are always two or more, but never three, five or seven. The size of this sacrifice depends entirely upon the quantity of nuts available.

2: Damm et al.--175-179 (1909) 1938 Woleaians
116, 396 Faraulep

There were small canoes uă ju mĕn, and large ones uă ju lăp; in structure they did not show any appreciable differences from the canoes of the Central Carolines. [CS: Omission of the words for the parts of the canoe, and the boat tools; page 176 has drawings of the canoe, page 177 some expressions used in sailing.] [178]

Canoe Building. The large canoes for the high seas are built at the command of the high chief, and belong to the community. The following legend tells how men learned about canoe building: once upon a time Eluelap ordered Thelăn to build a canoe on Ponape, so that people might sail between the two islands. A man named Natsău helped him with this work, and so he learned a good deal about the construction of the boat. It was fashioned of bread-fruit wood, and built with shell axes, after fire had hollowed out almost all of the trunk. The keel length was measured (tēti) as [179] 6 1/2 fathoms (oulăn năf ma kopōe), in other words, the keel length of a large canoe. This measuring line is dedicated to Thelăn, and on both ends it has coconut pinnates (tjăts). Then as today the caulking material consisted of the heart of the breadfruit tree and young coconut leaves. The canoe was completed in three months, and Thelăn named it uă. Today the work takes between two and three months; the most important tasks are completed in six days. The whole village helps, and an architect (sĭnap) directs the work. Men not engaged in the building take care of the workers. But the process is frequently interrupted to let the wood dry out, and the free time is filled with feasts, which generally last for six days.

2: Damm et al. --197 (1909) 1938 Woleaians
396, 782 Faraulep

According to legend, Alüelǎp had some more adopted children; and among them Thelán and Paluelǎp are especially important for the islanders. The former is the inventor of canoe-building, and it is to him that the natives dedicate the measuring string with two coconut pinnates (tjáts) hanging at the ends, and the canoe ax. The latter made the first sail, and he knows all the paths on the sea. For that reason, when the Captains want to be sure of reaching their goal safely, and of having a calm sea, they sacrifice a coconut and a mat to Paluelǎp in the canoe house. His son Elülüe is his helper in everything.

Tom's sisters; (6) Tom's two grown sons, one his own, the other adopted. The elder, his own son, was rather sulky and uncooperative toward him. (Analysis of this strained father-son relationship falls in Spiro's field.)

Three of these man [sic]--Magaleisei, Toromann, Auilimar--were considered master-shipwrights. Aueligar, an intelligent and energetic young man, is probably on hiw way to that distinction. In that case, beside meeting his obligation toward his mother's brother, the job would count toward finishing his apprenticeship.

The motivation in this case was not always strong enough to keep a crew of men on the job; perhaps because of the unusual circumstance that Tom himself was absent so much of the time, working for us, and hence could not inspire the other workers with his own enthusiasm. On October 2, he asked the chiefs to issue an order for more men to work on his canoe. The word spread rapidly, and within about an hour a number of men appeared, and got on with the job of fitting and fastening the planks of the hull. But on October 5 there was a public task--replacing the corner post in a canoe house--that took all available manpower. On the day after that, only Toromann and two other elderly men were at work on the canoe.

October 15 Tom announced angrily to the chiefs that he was not going to work for us on the following day. He was going to work on his canoe. Nobody had been at work on it for several days, he said; and if he spent all his time working for us, it never would be finished. This episode will be considered in detail in the chapter on government.

4: Krämer--91-92
116, 776, 463, 396

(1909) 1937

Woleaians
Lamotrek

In the discussion of navigation... Alúluel has been identified as the god of the navigators but also Lugeileng is closely connected with navigation.

As the builder of boats he is most important. He has many assistants among them Sëlang, Semalegóror, Semadjek, etc., who have been characterized in more detail in the chapter on religion, where there offices are explained in some detail. [92]

The head construction man, the séllap, (Truk: silelap) and his assistant, the rolifé-lefél, must not do any other work while they are engaged in the construction of a canoe; the one possible exception to this rule might be roofing. After the 5th day of taboos, the póufar... álisulap (Alúelap) conducts the ceremony lulur which frees the assistants from the taboos, whereas the headman is subject to them until the canoe is completed.

(Fig 60 [VMM: see source] which may not be used for anything but canoes. If the line tears, it is a bad omen for it may not be knotted. First the entire length of the canoe is measured off and then the line is folded and the halves are determined by finding the center, the lug. (Fig. 61a) [VMM: see source]. In a similar fashion the quarter sections are measured and marked off. Straight underneath two of these quarter section marks there are the two ends (fétang, Oleai; fátang) of the lowest keel, gapiálei. From the fétang ends the keel rises a little bit on both sides in the longitudinal direction and to the further end, gom; the part between the two ends, fétang and gom (Oleai: falegóm), is called gapiléisap and the section from the gom end to the bow with the figurehead is known as faisap (Oleai: fatob) (Fig 61a [VMM: see source]). It is important that the fétang end be laid correctly and that the keel between [94] the fétang is straight so that the canoe will not yaw. On both sides of the upper longitudinal line, a red line is painted on with a brush... for measuring the length; the paint must not be black because it would strangle the spirits. In a vertical cross section through the middle of the hull of the canoe, through the lug, the following lines appear: the keel, gapiálei, and above it the hollow djölifadj, which looks like a pandanus leaf; and above it as the upper margin the edge, úlut, which has been indicated in the longitudinal cross section in Fig. 61a [VMM: see source]. The úlut line in the interior is the boundary line

4: Krämer--92-97
116, 396, 784

(1909) 1937

Woleaians-1-9
Lamotrek

On Palau the felling of the tree from which a canoe is to be made is a sacred action, but on Lamotrek it does not involve any kind of ceremony. Felling of a breadfruit tree is called komádj ali mai, and transporting the felled tree is urur ali mai. Everybody lends a hand in the latter. The trunk is hauled to the beach where the rough work is to be done. In order to be able to move the tree, the trunk which is lying on the ground, is surrounded by coconut fronds and their pinnae are plaited together. Both the tree trunk and the stalks of the fronds are notched and fastened by tying, so that they may not slip as the tree is dragged away. This system makes hauling ropes unnecessary and the weight of the tree is somewhat lightened. The roughest work on the tree is done in the bush itself in the spot where it has been felled and is under the supervision of the god Simalegodjúat.... When the trunk has finally been transported to the beach, the actual construction work begins with rough-hewing with an ax. On this occasion the ceremonial ax sometimes is displayed...

The work on the beach is begun by instituting a fast. Women may not come to the place of construction but otherwise no special taboos are imposed. After the fast is over, the juice of young coconuts is drunk and their meat eaten. Cracking of the first nut, the giligel, is a solemn action; the term includes the word for stick got, and because it is an action it is made into molegot. The nut is placed in front of the person selected to crack it and the spirit Tautúp, the giver, is invoked.

[ER: a short prayer is said before the coconuts may be eaten, but it is omitted here.]

[93] Then follows the first blow of the ax, the kakilet... and the rough work on the canoe is done before the line is used.

Now is the time for further work on the breadfruit tree trunk which in the songs is simply called mai. The explanation of the second song by Faragau (house 1) revealed that in earlier times the tree trunks were soaked with oil inside and outside and charred in order to simplify the later treatment with the adze. But the work of the ax, the first blow, and the first steps at least were always important and done in as expert a fashion as possible. Another important step taken without special ceremony was

1. the laying of the keel known as tilegab (solegab, "the keel"). The keel is roughly worked.... When the keel is laid, the workmen fast all day long and may not touch any food but coconut juice; this fact is most strictly enforced when the line (Leine?) the tal e fálefal has been laid. It is not until the evening that food may be taken and then the banquet, iles, is held. On the second day, the day after the laying of the keel is the time of
2. the gapíleval, which means the "keel of the bush." It refers to the measuring of the trunk in order to determine the length of the hull of the canoe, the bul, which is done with the line talefélĕfel. *

*There are four different types of measuring lines, tal: a, tal i motaísam (spirit of the 1st sib.... b. tal i ngulu c. tal i gedj (connected with it is the 4th song of the canoe construction collection... d. tal i gudj (with it the 2nd canoe construction song). For every measuring line a song is necessary; similarly the taboos change with them.

of the bilge. Above it is the side of the hull known as órol which at the upper end is thickened, lugulepal; on this edge rests a wooden pole serving as gunwales, mesep (papa le vá) which is fastened by a string, ngareliva. Special care is taken when the bilge, the space above the keel is hollowed out. (Hellwig: niua). The bottom, lauâilol grating, is divided by means of coconut frond stalks into three sections similar to the space of the deck which has three red lines. Then the space is hollowed out and the bulkheads, the kábong, are not forgotten in the process. The line is used on the orol side. Attention is given to the thwarts, to:

1. tolefatefat
2. metangór often with failo reinforcement (Truk, page 229: fauílo)
3. tipalefang
4. ti válim
5. sáragio
6. fatamat with the lower bail seat

All this is taken care of on the second day. Then the measuring line is rolled up. While the hull of the canoe is dug out many mats are often laid out as a sign that work is under way. The people who pass the spot are greeted with the greeting of fâiro, in order that they may not spoil anything by their possible evil thoughts. [95]

3. velap. The work of the preceding days is improved and the exact sizes of the areas are determined. The uppermost line indicates the boundary for the

work. Everything underneath it is sacred work and everything above it does not matter. That is to say that attention is concentrated on the lower búl section of which as much as possible is left standing. Then the planks are cut and the figureheads for both bow and stern; their lower parts are called padj and the term applies to the section where they are fitted into an echelon-like groove above the gom, and then they constitute the section called faisap. Like a thigh they extend to the knee, borolemet, where the wood turns to the inside so that the heel, monga Selang... changes into the foot pointing to the outside or the forked metál i va, the "ship's eye". The two prongs of the fork are called mongarëdj and the upper sole of the foot seapolimet.

4. vëdjik. A day of taboos because the finer work is done on the keel section. Everything is checked and finished, including the planks. The god Meseiseit supervises this work....
5. póufar. It is not until this day that the boat rests on the keel. It is another day of taboos, no rough hewing may be done, but only detailed work on the superstructure. The planks that were previously cut are put in place but for the time being they are only temporarily fastened with hibiscus fibers (gilifau) and provided with wedges, djib or kadjór, which necessitates strict attention and supervision. One prays to Bórumai* "rising water," bor, and "good,"

*Belongs with Semalegóror...

mamai, i.e., good tide; [ER: a song, lulur, is sung on this occasion but is omitted here.] The canoe is filled up with coconuts and food for the god. Now the construction head may dismiss his assistants. In the final placing of the planks, coconut husks are utilized (pal ali va), they are laid down after artocarpus sap, bilis* has been put on the wood. The sap may be applied after the planks have been moved into place; in this case a smouldering leaf-sheath is held close to the stick with bilis. Now the péret approaches; the sewing on of the figurehead, padj, which is known as bau ipadj, is very difficult. Stitching through the holes with the gólemong cord...is known as yógeyog. [96]

6. kabukio with taboos. In order that the kio, the outrigger beams may be fitted in, kabuk, notches úoș, must be cut. One tries to do the fitting as tightly as possible. The kio on the leeside rest on the geligeaá and on the weatherside on the faramoe. In order to allow lashing "holes," ngata le olotráol, (Fig. 61c [VMM: see source]) are drilled underneath the uós. The drill resembles a chisel; in recent times it has been made from a piece of iron, búrubur, which

*The juice of the breadfruit tree trunk, the ralimei...is collected in coconut shells. One allows the milk to settle, pours off the water and washes the deposits in salt water; then they are filled into coconut sheaths and are kept in this condition; juice treated in this manner is called bilis.

usually is used only for the making of coconut slabs...in the past it was a piece of madrepore which had to fill this purpose. As the drill pierces the material, magic is made. It attempts to chase the evil spirits away. This is done by shouts of all present; eho! eho! eho! The calls are followed by a great deal of noise, more shouts and beating of the arms, etc. Then everything is lashed on temporarily or permanently. The sórang are made for it, the cuts between the holes through which the lashing is put.

7. votap. The hull is set up, the keel placed on longĕs beams; the longĕs are short wooden beams with grooves into which the keel is to be fitted. If it is impossible to fit the keel exactly, the error of cutting is repaired by coconut husks. If the canoe stands well and correctly, it is easier to do the work. At this point everything is done with a veiw to permanency. All shaping is done well and accurately because the wood shrinks as it dries. Now all small pieces are added.
8. kámor with taboos. The main job on this day is the smoothing of the hull of the canoe. Stretching out the line reveals the irregular spots; wherever wood is left standing high it is chopped down, but this work is done most carefully, a little at a time. This is known as the kalúl ali metál e boédj "the beautification of the face of the cement." For the caulk used on the canoe, the cement, boédj ali va, "cement for the boat," is prepared from burnt clay, which is mixed

with a great deal of coconut wood coal and is mixed with the liquid gained from young coconut husks. This caulk is pressed into the holes and cracks and any residue is removed by means of calophyllum leaves. Caulking may not begin until it is certain that the boat will not be a subject to future strong movement and the "beautification" must have been finished. [97] In this connection ray or shark's skin may be used, or corals. "Scraping" is called feïr; see faiür.

After the caulking, the painting is done. But before this step may be taken, the outrigger must be provided with the float, tam; this action is known as the fai eám (connected with the taboo val e vei, the "bush magic"). . . . And the stanchions ám must be fastened to the outrigger boom kio. At this time the men fast, for anganga sórosol, "work in the early morning," is necessary.

Painting of the Canoe

Now the painting may begin, but usually is postponed for some time. After cement has been applied, bedjē vā, on both sides of the hole, the boat is lowered into the water after at least four days have gone by. At this time the ceremony, gafeifei, is held; the canoe is decorated with young coconut pinnae, úbudj. . . all the fishing canoes that happen to pass throw fish over so that after a little while there are quantities of it large enough to provide for a banquet. And indeed a great banquet is given by the owner of the new canoe to the sellap and his assistants, and gifts to the gods are not forgotten on this occasion.

4: Krämer--92-97
116, 396, 784

(1909) 1937

Woleaians-9
Lamotrek

At that time, the rigging and sails are still lacking, but their names will soon be given.

Then follows the tárabos song...as a dedication ceremony and the last step before the canoe starts sailing. At this time all the taboos are ended.

4: Krämer--92-102 (1909) 1937 Woleaians
396 Elato

[VMM: For a description of the ceremony of canoe construction, techniques, taboos, etc., see 4: Krämer 92-102.]

4: Krämer--97
116, 396, 386

(1909) 1937

Woleaians
Lamotrek

Unless the canoe has been painted earlier, now is the time for it; the lower part of the hull, le djól le va, is painted black and so are the upper edge, mated, and the laterally sloping parts, lellap; above this area is the longitudinal band, far, and below it the hull is painted a shiny red (1010 Kramer, Color Plate 2).

The red color substance, lap, comes from Yap...and the painting itself is known as madjagoi (from dja red). Red earth is mixed with water in the paint bowl, tabbi lap, and is applied with the brush, gololie, of the coconutsheaths. If one is dealing with large areas, one uses the husk of a coconut. When the paint has dried, it is covered with artocarpus milk, ralimei, which has been mentioned above in a different connection.

The black paint, rel, made from hibiscus wood (marafai) or coconut husks (not coconut shell) is also mixed with water. It is fixed with a preparation of scraped skin and the juice of crushed Ipomoea, djaival; Ligadjelap is the god of the painters.... When the black-red coat of paint is applied, the boat is ready for the big voyage ahead of it. Paint bowls and paint brushes must not be misplaced.

4: Krämer--97
116, 552, 396

(1909) 1937

Woleaians
Lamotrek

The name of the boat is chosen after the tree whose trunk was used, or the land on which the tree stood.

4: Krämer--98-102 (1909) 1937 Woleaians-1-4
116, 396 Lamotrek

[ER: A glossary of canoe parts follows in the text, but is omitted here.]

[100] The Sail

The sail, ua, (longaliu two long poles on which the sail rests) is hoisted on the mast with the halyard (Fig. 61d), úrur, which is fastened to the yard by means of the timber hitch, kolliva (l); there is also an auxiliary halyard, sós (d). The sheet, moél (d), is tied to the boom, lim; next to it towards the neck there is a loop, talitor (d), a piece of rope fastened by both ends and hanging down like a bow so that the tackle can be attached and ease the sheet. At the tip of the boom there are two more cords or small ropes, ápiteg (d), used for lashing the sail to the notched end, gobur, of the yard or the bow (cf. Kramer, Samoainseln, Volume II, page 258, Fig. 29). The gobur end is like the handle of a knife; it becomes thinner towards the yard and is dagger-like in shape and this part is lashed on in order to lengthen the yard; fefe is the word for the lashing together of two wooden parts. As a matter of fact both the yard and boom show several lashings which serve to fasten the sail and which are called mop; the various rings are connected by means of longitudinally extending pieces of rope (i), vl (see Kopfschlage (?), kat). Soon after completion the sail is fastened to the mop of the yard but not to that of the boom, in order that the latter may yet be removed and the sail fitted to it. The latter consists of the "dresses" sail, salil, ruiel, the mat strips screw together in the shape of a triangle by means of the seam góruseg (see Plate 17d); [VMM: see source] the horizontal seams all end with a bow, gakit (Fig. 61h) [VMM: see source] and the

sewn strips are stretched between these bows. When the wind is very strong, a rope taligakit, is sent through them which is fastened to the two upper cringles [101] and serves as a substitute for the lacking wooden support on the third side. In order to straighten the dresses little rods, djifel, are used; stretching is known as gameil and the cracking that accompanies it is called sangarenger.

In order to give firmness to the sail in a fresh breeze* about 62 telap ropes (d)t, are used extending vertically down from the yard one rope each runs through two mop rings (Figure 6le [VMM: see source]), whereas below on the boom they have free ends (d); every end is fastened to the line vatelap (e) vt (not shown on d); the rope ends, tabotelap are twisted like a cord, turned together and laid along the vatelap on the bolt rope, dautel. The edge of the whole triangular sail is reinforced by a rope, the so-called bolt rope, dautel (see Kramer Samoaianseln, II, page 258, Fig. 29), which like our leech

*In a strong wind the sail is shortened; this is done by untying the mat-sail from the yard and boom to about the spot of the halyard, urur, and the sheet, moél. The end of the sail that is thus freed and hangs loose is folded back towards the neck, and, if possible, is held here by a net in order that the sail does not bulge too much, because it would send the canoe too far over on the luff side. Naturally the sail area is also limited by taking in the reef; talitarak is the term for the reef line (the same as in Ralik).

ropes are used to fasten the sail to the boom and yard. Since the mat is rather fragile as compared with our sailing lines it is turned in, the bolt-rope is treated in a similar manner and the ends are used up (f). But on top two ropes are lashed on as may be seen on e and f, The vatelap vt and the valifarafar vf; the former, as mentioned, the telap ropes are fastened below; but the valigafararfar serves to connect the sail to the lashing of the yard and boom (i) and its connecting lengthwise rope is also known as valiga f fárafar (vl). The ends of the bolt rope and vl are fastened to the fork of the boom (d lower right) and vt is tied to the yard-arm and boom since it is non-existect on the third side which does not have any wooden reinforcements; here the bolt-rope and vf are also known as tali metalu.

lalebógol	the rope used to lift the halyard close to the mast and the eangelap in the course of paying out the sail-rope.
tal e rúopin*	rope filling the same purpose, with the one difference that the two ends are free and gird the mat and halyard.
talitarák	reef line (like Ralik)
paddle	fatúl; as is the case further east paddles with knobs occur
rudder	fatul e bupo (on Truk: fedil a bú), fatul ulul; storage space fo; bulkhead, gábeung; bail, gámat; lower thwart, iselimát,

*djukupin is the term for canoe on Yap.

for "to bail," gamát.)

The figurehead is the well-known forked tail with the fork seapolimet; at its foot it becomes narrow and the narrow spot is called mong a Selang "forehead of the Selang" after the god of that name who is considered the inventor of the figurehead. [102] The two prongs of the fork are called mong a redj, "forehead of the seabird redj"... third day.

4: Krämer--102 (1909) 1937 Woleaians
116, 396 Woleai

On Oleai the prongs of the fork [VMM: of a canoe figurehead are also known as mongo Sëlang; it is actually the notch of the fork which is known by that name of gilimel and the rabbet extending from the outside from the notch to the keel is the falegilimel (fale="below"). Inside, in the direction of the hull a small quadrangular slab, nalimat, is found lying underneath the prongs and the sloping area further down is known as ataulibodj. The points of the fork prongs are called móngoros. I learned all these terms on Oleai.

4: Krämer--102 (1909) 1937 Woleaians
116, 533, 396 Lamotrek

There are many canoe songs, because the principle is that everyone should invoke the gods' assistance in his own particular way in order that the canoe may turn out to be beautiful, luck may be with its passengers on their voyages, etc. In particular, every measuring line has its own song....

[ER: The native texts and translation are given for some of the canoe songs, but are omitted here.]

4: Krämer--127 (1909) 1937 Woleaians
116, 396, 502, 288 Lamotrek

In Garapan there was a shipyard where the Carolinians could learn the construction of boats; connected with the shipyard was a school of Carolinian navigation. Anyone who wanted to be independent and in charge of a boat had to pass an exam before a council of pilots. Close by was a rope-making establishment. There the material for the ropes-to-be was hung high on a palm tree and the strands were twisted and each one had a circumference of 4-5 inches. Ropes were made up to a length of 100 fathoms.

4: Krämer--127-128 (1909) 1937 Woleaians-1-3
116, 396, 502 Lamotrek

Anchors do not exist. If it is necessary to fasten a boat, one of the crew jumps overboard and belays one end to a rock. A similar procedure is followed when the canoe is to be cleared for departure. The islanders do not worry about deep water and sharks.

The boats built had a length of 30 feet in the keel, a width of four feet and a depth of 6 1/2 -7 feet from the deck to the keel, with a draught of 2 1/2 feet front and aft. The stern-post strakes are alike, and the bow and stern are identical in shape. No nails are used in the construction; the planks are fastened together by means of strong coconut yarn and the holes are stopped up with cement. The frame-planks are less than one half inch in thickness and do not have any ribs. All the work is reinforced by strong dollboard gunwales of considerable size; they are connected by thwarts, all of them in the same height. The two sides are different in form and one is more beautiful than the other. They do not attempt any tacking with these canoes. The weatherside is fuller and more rounded than the leeside and the ratio is almost 3:5. The outrigger is attached to the weatherside--on the Philippines batangas--and is a strong tree trunk; on the end rest two transverse beams, which are 8-10 feet outside of the canoe. On the leeside there is a platform outside of the dollboard gunwales and it is formed of long poles; on this platform a cabin--a bamboo construction--is placed. This little hut resembles a large basket and in it provisions, freight, and sometimes passengers are kept. The crew is generally crowded together in the hull of the boat. The mast usually has a height of 22 to 24 feet and is not planted on the keel, but on the gunwale of the weatherside. It

is kept in its position by stays, by means of which it may be lowered if the velocity of the wind requires it. The sail is made from very fine mats and is almost triangular; it is stretched between two bamboo poles and at each corner is manipulated by lines, halyard, tack and sheet. [128] The rudder is not at the stern* but on the leeside and has the shape of a paddle; the Carolinians say that it does not only serve to steer the canoe but also to keep it straight; the latter proves the skill of the person steering and requires a good deal of dexterity. It is difficult for navigators to establish a clear picture of this in their minds, but it is probable that we should believe the Carolinians. It is not unlikely that it is their intention to sail against the wind (in den Wind anzuluven?) when it becomes stronger, so that the lateral pressure on the sail may be decreased. In any case a good deal of experience is needed and all possible care and attention in order that the canoe will not capsize or be flooded over the leeside gunwales. Ten or twelve persons may stay on board and most of them sleep in the hull of the ship. They fill the basket with coconuts, and if they have a passenger who is not a Carolinian, he, too, is put into it. They loosen the anchor ropes, set sail and go out to sea. The sheet is never belayed: all day and all night during the entire voyage the person steering must hold it regardless of how long the boat is out sailing. Some of the steersmen have assistants on their long voyages. When he lets go of the sheet, and the boat capsizes, the crew has to swim like

*The meaning is that it is not all the way at the stern like our steering rudder.

the basket with provisions. The steersman without help re-establishes the balance of the boat; if the equilibrium is lowered on the weatherside the canoe is put back into position almost by itself and little aid is needed. Then the crew goes back on board, catches the basket, and the voyage is continued.

4: Krämer--185 (1909) 1937 Woleaians
116, 396 Woleai

Boats: the natives of Oleai excel in the construction of sailing canoes. They build two kinds: small canoes for use in the lagoon and large ocean going canoes which they use for deep sea fishing and in which they undertake voyages as far as Truk.

Canoe Construction
by the sel'lap Robgail

When someone wants a new boat, he discusses the matter with the boat builder, the sel'lap. He picks out a breadfruit tree and it is felled. The tree has or receives a name which later is passed on to the canoe. The sel'lap asks: "How long is the boat to be?" The owner of the canoe-to-be: "Five fathoms." The sel'lap: "All right, let us cut four fathoms." Then the tree trunk, bul, is dragged into the canoe-house on the beach where the boat is to be built. All the men help with the transportation and they are given food for it, fish, taro, coconuts, etc., known as the bai lŭrúr oā. Later while the work is under way, the sel'lap receives three bowls of food daily and on every tenth day fifty bowls for his assistants and his family; this ration is known as the bai le fálĕfal or the bai le oā.

With the broad ax, the adze, gasuéla, the trunk (bul ēli oā) is given the desired shape; then the stem, the mât or badj, the bab planks, and the outrigger booms, kio* are cut. When they are completed, the sel'lap receives small gifts [261] of mats and faibar, and

*This, the weatherside, is called palietam; the outer side, íketa; fale, below and from it the space underneath with its three parts derives its name: 1. fale báraf (báraf see below, 2. fale fang (fang, grating) or falesē and 3. o niáusap.

this contribution is known as the gakõul le vá. Then follow the arched luff plank, the faramoi, the gunwales on the weatherside which are called galigasa and the gunwale mesap, which connects the faramoi and badj. Everything is fitted but it not fastened together and is taken apart again. At the time of final joining of the planks, breadfruit sap (bílis) is smeared on the gunwales, and coconut husk fibers are added. Before they are moved into place, the gunwales are held over a fire for a short time. The sap is prepared by collecting the milk which flows from the wounds of the trunk in coconut shells and boiling it on hot stones. The sap is taken out under water and filled into coconut sheaths in which it is kept. Caulking is done just before the canoe is launched.

Now is the time that the thwarts are made, the dó.

1. do le fatefat on the outside
2. mát ongor
3. tívětif
4. doïaĭü
5. sasakio

Next attention is given to the baraf plank, the luff platform (líbarap) (faraf) and the ülingal (head rest, ülül) ma lẽ masur "his head rest for sleeping."

The diagonal braces, matárafang gird the grating, fang. The grating on the outside, in the direction of the weatherside, is called djodjo lič̆lau or lelial a luluei, "sleeping

place of the god."

In order to fasten the fang to the kio (boom) two large bindings, eagatiu le baraf are used.

Now it is the turn of the interior of the canoe, the niva. The bulkheads gábung, are left standing and the hole, logolog, at the joints of the matárafang, between it and the ülingal.

Then follow the four eam stanchions (Figure 128) [VMM: see source] with their firm lashing, fofollam, and above it the transverse pole vasoso and the yoke, valeangelap, for the belaying of the luff stay, ë angalap. Photos 15b and c [VMM: see source] [262].

Furthermore, four djë, crooked outrigger booms with three transverse poles, are added; the one on the outside is called gabidjë, the one on the inside (of the pegs) daried-jë and the one on top at the kio is known as eŏpasa.

The lee platform, ëbep (Photos 15b and c)[VMM: see source] rests on two sua which are placed under the suilap and the kio. A transverse frame plank is known as volivalëbep and on it rest the two superstructure thwarts, the folag and the cross thwart, folag iës. Two frame poles extending alongside the sua are called paliebep and one that runs across on the outside is called valiëbep. The poles of the bottom of the platform are the taragalíebep, the outer grating is called fang ali ëbép, the hole in it vi eli ëbëp.

Born lists the following:

large canoe wa luwë

thwarts to lean against falak
outrigger partitions geimeru, serves as shelter against the wind

Rigging Rope, sos.

mast, gois; halyard for the sail, urur.
luff stay, eángalap; fore and aft stay, tálligas (tënegaj)
lee stay, dáugeta (iketa, lee; itam, weatherside)
gãg to steer
bail, gamát
sail, li (eū); yard, juju and its heel áviteg; boom, lim.
sheet, moél (block, gárigerig)
binding of the sail, mobulíra; sections, tëlab, seams across, tëgaro.

Figure 129 [VMM: see source]: paddle, fádul with Singknopf?, róvuj eorior.

When the sel'lap has finished everything but the deck huts which he himself builds only for the great voyage, there follows the great payment, the góu sel'lap in the form of wooden bowls, faibar, mats, mosquito nets, knives, axes, etc., and anything wise that that may be available. In former times this payment might have taken the form of up to 100 wooden bowls but now the number is usually down to 30-50. Finally follow the banquet and prayers.

[ER: The words of some boat songs are given in the text, but they are omitted here.]

4: Krämer--260-262 (1909) 1937 Woleaians-5
116, 396 Woleai

The songs are:

1. Song before the voyage. With or without storm magic (goselefei).
2. Canoe construction.
3. Song after the completion of the canoe.
4. Prayer for the coming voyage offered in order to catch a large number of fish. Request for great heat, because it brings many fish.
5. Song used on the occasion of angle line fishing.]

4: KrÆmer--271-272 (1909) 1937 Woleaians
116, 396 Woleai

Making the boat ready implies mainly caulking (bosĕliva) in order that the canoe will not leak. It is done with uedj "cement" mixed in the following manner: coal of coconut husks is crushed with lime and the juice of expressed young husks is added, and the juice and powder mixed.

The lashings are checked. The deck huts, gaimoém, are made anew, and the ropes and the sail and, in short, the entire rigging. The hull of the canoe is painted over.

When everything has been completed, the canoe is set afloat, and as soon as a strong breeze arises, the "maiden voyage" takes place in the inland waters. If it is successful, the canoe is passed as ready for service. The captain hires four or five men as sailors, jŏliva; one stipulation is that the crew must go willingly and that the men must not be forced to accept the jobs.

The women are told to prepare provisions for the pallū and the jŏliva; breadfruit dough, mar, leads the list as the only preserved food. [272]

When there is a good breeze from the east (gótimei) everything is taken on board. Special care is taken that there may be sufficient supplies of young coconuts for drinking, and old ones for eating. Twenty to thirty coconut water bottles are included among the provisions; they are filled with fresh water. Finally the pallū comes with the storm magic. It is suspended from the deck hut, the space in which the pallū lives on the voyage.

6: Senfft--55
116, 396, 501

(no date) 1905

Woleaians
Woleai
Lamotrek

Their canoes are made of the wood of the species of breadfruit tree which bears seed. The canoes may be as long as 10 meters from bow to stern; the keel curves downwards and the end pieces are forked. On one side of the hull there is an outrigger and a sturdy bar running parallel to it, on the other side there is a broad platform where members of the crew may rest and where the supplies are kept. This platform is provided with a roof as a protection against the rain and the sun. The sail is made of plaited pandanus leaves; it has the shape of a triangle two sides of which are framed. The corner of the sail formed by these two sides is inserted into a groove in the end piece. The fore and aft end pieces are constructed in the same way. All parts of the boat are sewn together with coconut strings and the cracks are calked with fibers and the resinous sap of a plant. They do not groove the planks used for the canoe; for that reason, and because of the fact that there is no cover for the hull of the canoe, it is always necessary to bail water. A sturdy paddle with a broad leaf is used for steering. The canoes used for shorter trips, within the lagoon or for fishing expeditions, are built according to the same pattern.

There are two basic types of canoes, which again have two subdivisions each, those used for sailing and those used for rowing. The generic term for canoe is w(u)a. The canoes for rowing are privately owned; of these, some are built for one or two persons, tschosmal, and some are larger, accomodating 11 or 12, wafetul. They are made of wood from breadfruit trees, and the separate pieces are lashed together with coconut yarn and glue. This glue is made of burned pulverized coral lime, ashes of coconut shells and the juice of fatsch roots. The two outrigger, tamur, poles are placed in the center of these canoes [182]; these are forked and are set into the outrigger and made fast with coconut ropes, golgol, tied in elaborate knots. In the small canoes, a board made of wood from the breadfruit tree is placed over the outrigger poles to be used for sitting. The large canoes have eight or nine narrow benches for the men who are rowing, and a rectangular wooden platform with a reenforced edge, faref, which is used to store equipment and supplies; it takes up half the length and the entire width of the canoes and is placed on the outrigger poles, toward the outrigger and outside of the canoe proper. The canoes are equipped with short paddles which are easy to handle, fatel; there are made of safang (Calophyllum) wood and are slightly curved at the points.

All of these canoes have an attractive, slender shape. They have forked end pieces like those of Jap, rassim. On Jap there are no canoes for rowing; they are very handy for the people of Oleai, however, who use them for short trips among the neighboring islands.

The natives here are experts in the construction of canoes for sailing. There are two types of these: wamar, small canoes used within the lagoon, and waluwe, the large canoes used for deep water fishing and for the large expeditions to Ruck. By European standards, these large canoes are also quite useful for shorter trips. There are wide benches with back rests, falak, in the center of the canoe; for protection from wind and rain on longer journeys, there are huts, geimeru, on the outrigger.

The natives use carefully finished blocks of wood for the tackle. They learned this device from merchant ships; on Jap it is still unknown.

28: Spiro--38 (1947-48) 1949 Woleaians
116, 476, 764, 505, 396 Ifalik

"The other construction [WPM: other than sein making] that is performed cooperatively is canoe-making, and here kinship plays a significant role, particularly in the construction of small canoes, which are owned and used by one person. In the construction of large canoes, many men will assist the owner because the task requires a number of hands at certain stages of the process, and also because, though owned privately, it is used for many communal purposes, such as burial and inter-atoll travel."

28: Spiro--38 [2]
116, 396, 476, 602

(1947-48) 1949

Woleaians
Ifalik

"In analysing the kin relationship of those assisting in canoe construction, we again observe the functioning of patrilineal and affinal relatives, as well as matrilineal relatives. For example in the construction of Tom's ocean-going canoe, the men most in evidence were his brother, his sister's son and a classificatory sister's son, as well as his sister's husband, his classificatory sister's husband, and his wife's brother, besides a number of men of both Rauau and Felarik who were not related in any form. In the construction of a small canoe that I observed, those who assisted the owner were his mother's classificatory sister's son, his mother's brother, his foster brother, and his dead mother's classificatory sister's husband--the latter doing the brunt of the work. In another instance, the man was assisted by his father, the foster father of his daughter, and his sister's husband. I list these in detail to indicate the importance of kin other than the lineage or the clan in economic activity."

"In the construction or repair of an ocean-going canoe, a number of other men participate [WPM: other than kin], particularly the men of the man's district. When the hull on Tom's canoe was to be fitted I counted 36 men participating in the job. The owner of the canoe provides food for all the participants when the task is completed, and in the case of the main workers, presents them with gifts of rope and lavalavas.

Now, aside from kin, whose cooperation is culturally ordained, the cooperation of the other participants is entirely voluntary (4), so that the degree of cooperation is a function of the esteem and respect that the initiator holds in the society. The well-liked man will receive much assistance, whereas he who is less well liked will suffer accordingly. We have already alluded to the lack of cooperation Tom received in the construction of his canoe, and his need to appeal to the chiefs to get fuller cooperation. This may be contrasted with the cooperation that Gaveleisei received when his ocean-going canoe required a complete over-hauling. He let it be known that he would need assistance, and the next day the entire man-power of his district had turned out, as well as many men from Felarik and Falalap. This display of cooperation was unquestionably a function of

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"4. There are exceptions to this, however. When he arrived on the island, and Tom was appointed as our interpreter, the chiefs ordered the men of Felarik to assist in the construction of Tom's canoe, since he would have little time to devote to it."

Gaveleisie's personality. He is a person highly respected by his fellows, and justly so; he is a magnificent human being, intelligent, talented, and sensitive. When I informed Tom of the great number of men who had come to assist Gaveleisei, he explained that the task was easy, and that any person knew how to perform it. Tom was correct in saying that it was a relatively easy task, but there is little question that it was Gaveleisie's personality that accounted for the large turn-out, and that Tom was trying to rationalize the discrepancy in numbers between those who assisted him, and those who assisted Gaveleisei. The simple fact is that Gaveleisei is liked and respected more than Tom."

28: Spiro--38 [4]
116, 784, 396, 501

(1947-48) 1949

Woleaians
Ifalik

"Except for the taboo on the owner of the newly-constructed canoe to participate in repair jobs, I discovered only one other taboo in canoe-construction. When working on the keel, the men must fast until the afternoon."

28: Spiro--39
116, 396, 226, 501

(1947-48) 1949

Woleaians
Ifalik

"There is one ritual ceremony connected with the construction of a large canoe. After the canoe is painted, a fire is lit outside the canoe-house for four consecutive nights, the canoe remaining in the canoe-house for that time. Failure to light the fire, would result in the men being unable to catch fish from that canoe--the fish would simply not bite."

28: Spiro--74 [4]
116, 776, 782, 396

(1947-48) 1949

Woleaians
Ifalik

"For a canoe construction it is Selang-i the patron saint of canoe carpenters, who receives the io-io. His too, is the dual offering of coconut and food. At the completion of the canoe the head carpenter places a coconut along side of the canoe, and says, 'I give you this coconut; suppose I make another canoe, (assist me so that it will be) very fine.' Again when the men gather for their feast, the head carpenter expresses the same sentiments, and discards food from his plate, as a io-io to Selang-i."

28: Spiro--75 (1947-48) 1949 Woleaians-1 - 2
116, 788, 241, 342, 396 Ifalik

"It is of note that Malinowski's observation that ritual is used in those areas of life in which the degree of control and predictability is slight, is borne out on Ifaluk. There is no garden ritual of any kind that I could discover. The taro grows regularly, only weeding and transplanting with fertilization being required. There has never been a crop failure, or drowth or any other unforeseen contingency that has effected the supply. Breadfruit and coconuts grow without any tending. Thus in these matters there is no ritual. There are a number of taboos, the violation of which will adversely effect the food supply, but that is a different matter.

But in hazardous undertakings, such as house construction, in which there is the chance of men being crushed to death; or ocean voyages, in which storms may sink the canoe or drive it off its course; or canoe construction, in which a faulty job will endanger lives, ritual is used. Not only are the io-io offered, but there are other rituals performed as well. After the canoe is completed and before it is painted it is sailed inside the lagoon to find out whether and where it may leak or may be faulty otherwise. When it is brought back on land, one of the carpenters sits astride the canoe and recites certain set formulae while waving a coconut branch over it. Unfortunately I did not record the texts but

it asks that the canoe be speedy, that it not drift away when on a journey, and that it not be shattered. (30)"

"30. This ritual is known as the gavaiven. I chanced to see Taroman performing the ritual, and I asked Tom what it was. He became quite sheepish, and said, 'I don't know, another place, another color', which means for reasons, I have never been able to understand, that every society has its own customs, which is a charming way of stating the position of cultural relativism. He proceeded to describe a ship-christening he had witnessed in Manilla, which was, to his way of thinking, the western analogue to the Ifaluk custom."

41: Bates & Abbott N-5 (1953) 1958
OR21 Woleai OR21
Ifaluk

Katelu where Maur's spirit lingered; there was a tiny, thatched "god house" in the Valul household area on Falalap; and an immaculate, sanded circular altar as part of the Weluar household area. We called Arueligar the "high priest" because he had the highest ecclesiastical authority on the island, officiating at the few religious ceremonies we observed. Husky, handsome Truesai was his designated successor.

Ted, both in 1948 and in 1953, devoted much time to collecting notes on religious beliefs. He felt that these beliefs were steadily weakening, that he could notice a difference in this respect between his 1948 and 1953 visits. The gods, however, were still with us in 1953; alus, spirits, who haunted certain places, governed various natural events, and interfered for good or evil in the affairs of men. Ted collected a list of nine high gods, and of dozens of lesser spirits. He found, for instance, twenty-seven different alus concerned with different matters in connection with navigation and canoe building—though these, to be sure, are basic activities, much subject to divine guidance in any maritime culture.

My impression, however, based mostly on Ted's writings, notes and comments, is that the Ifalukians were far from having an organized theology. The accounts of divine affairs that Ted got from Arueligar and from the chiefs did not always agree; and most people apparently gave little thought to such matters, leaving them to the chiefs and the specialists. The alus were present, all right, but accepted as a part of the natural order of things: the spirits that every folk find in the world around them.

The vast majority of the alus were spirits of the dead. No one died while I was on Ifaluk, but Ted and Mel Spiro observed four deaths during their 1948 stay. They have described these in their book on Ifaluk: the intense preoccupation on the part of friends and relatives with trying to save a seriously ill person by every natural or supernatural means, the nightly wailing chants, the great seriousness surrounding possible death, and the abrupt relaxation of this seriousness once death has occurred, once the alus has left the body. They ascribe this attitude to the firm belief in the continuity of the soul.

The body of the dead, however, is given ceremonial treatment: the face is painted red, a new loin-cloth or skirt is put on, and then the